

**ALTERNATIVES ANALYSIS
AND
AQUATIC RESOURCE AVOIDANCE GUIDANCE
FOR TRANSPORTATION PROJECTS**

I. INTRODUCTION

The goal of this appendix is to provide guidance on conducting alternatives analyses to meet the requirements of NEPA, SEPA, and Section 404 of the Clean Water Act. This guidance is provided for project sponsors and the planning, regulatory, and resource agencies. It is to be used in the project scoping and budgeting, and the project development stages. Although potential alternatives are evaluated at each of these stages, it is not usually until the last stage (that includes NEPA, SEPA, and 404 permitting) that substantive determinations regarding the adequacy of alternatives development and analysis occur. This appendix provides guidance on how to consider aquatic resource issues and associated sensitive species, including threatened and endangered species throughout both of these stages. Also included for each stage is a summary of existing guidance, and examples to illustrate how the regulatory/resource agencies view practicability.

The basic requirements of NEPA, SEPA and Section 404 of the Clean Water Act are described below.

A. National Environmental Policy Act, State Environmental Policy Act

NEPA regulations require the preparation of an EIS for major federal actions that significantly affect the human environment. (An environmental assessment may need to be prepared to determine whether an impact is significant.) NEPA regulations (40 CFR Parts 1500–1508) require that an EIS rigorously explore and objectively evaluate all reasonable alternatives (See section II.A. below). SEPA regulations require the preparation of an environmental impact statement (EIS) for projects that would have a probable significant adverse impact to the environment.

NEPA requires that mitigation be discussed as a part of each alternative or as a separate alternative applicable to the other alternatives. This does not mean that a compensatory mitigation plan is required for each alternative. Mitigation pursuant to NEPA includes avoiding, minimizing, rectifying, reducing, or eliminating over time, or compensating for the impact(s) (40 CFR § 1508.20). SEPA parallels NEPA in this regard for actions subject to SEPA that will result in probable significant adverse environmental impacts.

B. Section 404 of the Clean Water Act

1. Alternatives Analysis

The Guidelines promulgated under Section 404 of the Clean Water Act specify that a permit can be issued for a discharge of dredged or fill material to waters of the United States only if the discharge is determined to be the least environmentally damaging practicable alternative (LEDPA) (40 CFR § 230.10(a); Section 404 sets out other requirements as well (see section I.B.2. below). When a proposed project requires an individual permit for filling waters of the United States, an analysis of alternatives must be carried out. For this analysis, the LEDPA generally is the practicable alternative that either avoids waters of the U. S. or impacts the smallest area of waters.

For non-water dependent projects (essentially all surface transportation projects) that require filling of wetlands or other special aquatic sites (see definitions), the Guidelines also presume that there are upland alternatives available and that these upland sites are less environmentally damaging. The burden to prove otherwise is on the project sponsor. In particular, the “no action” alternative, and projects that avoid or minimize fill, must be carefully analyzed. An alternative with fewer impacts to aquatic resources than the preferred alternative may be eliminated by demonstrating that it has other overriding severe environmental impacts; i.e., that it is not practicable.

2. Other Requirements of Section 404

a. The Section 404(b)(1) guidelines state at 40 CFR § 230.10:

Although all requirements in § 230.10 (including the alternatives analysis) must be met, the compliance evaluation procedures will vary to reflect the seriousness of the potential for adverse impacts on the aquatic ecosystems posed by specific dredged or fill material discharge activities.

b. In 40 CFR §§ 230.10(b)–(d), the guidelines further state in part that:

(1) No discharge of dredged or fill material shall be permitted if it:

- (a) Causes or contributes . . . to violations of any applicable State water quality standard;
- (b) Violates any applicable toxic effluent standard or prohibition under Section 307 of the Act;

- (c) Jeopardizes the continued existence of species listed as endangered or threatened under the Endangered Species Act of 1973, as amended, or results in likelihood of the destruction or adverse modification of a habitat which is determined by the Secretary of Interior or Commerce, as appropriate, to be a critical habitat under the Endangered Species Act of 1973, as amended. If an exemption has been granted by the Endangered Species Committee, the terms of such exemption shall apply in lieu of this subparagraph;
 - (d) Violates any requirement imposed . . . to protect any marine sanctuary designated under Title II of the Marine Protection, Research, and Sanctuaries Act of 1972.
- (2) . . . no discharge of dredged or fill material shall be permitted which will cause or contribute to significant degradation of the waters of the United States. . . .
 - (3) . . . no discharge of dredged or fill material shall be permitted unless appropriate and practicable steps have been taken which will minimize potential adverse impacts of the discharge on the aquatic ecosystem. . . .

C. Comparison of NEPA, SEPA, and Section 404

The analysis requirements of NEPA, SEPA, and 404 regarding avoidance are slightly different but fully compatible. A 1990 Memorandum of Agreement between EPA and the COE (reference listed in section III.A. below) recognizes the value of each mitigation component defined under NEPA, and ranks them to ensure that avoidance of impacts occurs first, before efforts to restore or create compensatory habitats. The impact analysis associated with alternatives should be formatted to reflect this priority.

Because a Section 404 permit can be issued only for the LEDPA, Section 404 compliance usually requires a more detailed and specific analysis of the aquatic impacts of each alternative than NEPA or SEPA. Joint NEPA/SEPA or SEPA documents should provide enough information on alternatives to determine if selection of the preferred alternative complies with the 404(b)(1) Guidelines.

II. ALTERNATIVE SELECTION

A. Criteria for Identifying Reasonable Alternatives (NEPA, SEPA)

The evaluation of alternatives must consider a reasonable range of

options that could fulfill the project sponsor's purpose and need. Reasonable alternatives are those that "are practical or feasible from the technical and economic standpoint and using common sense, rather than simply desirable from the standpoint of the applicant" (Council on Environmental Quality, 1981; see IV.A. below for reference).

The range of alternatives to be considered should include at minimum: 1) alternative ways of meeting the project sponsor's purpose and need at the same location; 2) alternative locations; and 3) the "no action" alternative. The evaluation of the environmental impacts of all reasonable alternatives must be presented in comparative form to provide a clear basis for choosing among options. If alternatives are eliminated from further analysis, either the environmental document or a separate alternatives analysis must discuss the reasons for elimination.

B. Criteria for Identifying Practicable Alternatives (Section 404)

For transportation projects, generally, an alternative is practicable if it: 1) meets the purpose and need; 2) is available and capable of being done (i.e., it can be accomplished within the financial resources that could reasonably be made available, and it is feasible from the standpoint of technology and logistics); and 3) will not create other unacceptable impacts such as severe operation or safety problems, or serious socioeconomic or environmental impacts.

Alternatives can be eliminated at any stage if they are not "reasonable" (NEPA and SEPA), or if they are not "practicable" (404). However, the reasons for eliminating an alternative from detailed analysis need to be documented and discussed in the document prepared at that stage. Based on this information, the project sponsor must get signatory agencies' concurrence that there are no other less environmentally damaging practicable alternatives than those identified.

C. Consideration of Other Environmental Impacts

The Clean Water Act 404(b)(1) Guidelines require that the practicable alternative that would involve the least adverse impact to aquatic resources be chosen unless this alternative would have other significant environmental consequences (40 CFR § 230.10(a)). Similarly, Section 4(f) of the Department of Transportation Act allows the transportation agency to reject an alternative as not feasible and prudent if "unacceptable adverse . . . environmental impacts" would result (FHWA, November 15, 1989). Thus, both regulations allow the potential for other significant environmental impacts (such as socioeconomic impacts, hazardous waste sites, etc.) to override either protection of aquatic resources (in the case of Section 404), or preservation of public park and recreation lands, wildlife

refuges and historic sites (in the case of Section 4(f)).

Sometimes the only practicable alternatives available would either fill aquatic resources or impact Section 4(f) resources. Thus, in some instances, it may be necessary to accept impacts to one resource in order to avoid or minimize impacts on another resource. The alternatives analysis should reflect the equal consideration of Section 4(f) and Section 404 concerns when evaluating alternatives. However, this equal consideration may change depending on specific project and community circumstances, and the magnitude of the impacts. The alternative that would result in the least overall environmental harm as determined through discussions with regulatory and resource agencies needs to be selected.

An important distinction to keep in mind when evaluating harm to non-aquatic [i.e., 4(f)] resources versus harm to Waters of the U. S./Waters of the State, is that, for the former, the alternatives selection process evaluates reasonable and prudent alternatives based on the “net harm” (after mitigation) of the alternative to 4(f) properties or other environmental resources. In contrast, for almost all Section 404 alternatives analyses, the evaluation of practicable alternatives must consider the impact to Waters of the U. S. that would result from the alternative before compensatory mitigation (see the “Memorandum of Agreement Between the Environmental Protection Agency and the Department of the Army Concerning the Determination of Mitigation Under the Clean Water Act Section 404(b)(1) Guidelines” (February 6, 1990) for exceptions to this). This Agreement expressly states that “compensatory mitigation may not be used as a method to reduce environmental impacts in the evaluation of the least environmentally damaging practicable alternative.” Therefore, if an alternative exists where the impacts to non-aquatic resources can be practicably mitigated, this alternative should generally be selected over one that would fill Waters of the U. S./Waters of the State.

III. ALTERNATIVES ANALYSIS FOR PROJECT SCOPING AND BUDGETING STAGE

This stage identifies funding needs for project delivery. Efforts should be to set budgets that maximize flexibility when identifying reasonable alternatives. For projects with potential impacts to Waters of the U. S./Waters of the State and associated sensitive species including threatened and endangered species, the project sponsors should identify the full range of reasonable alternatives (including a focused evaluation of avoidance alternatives), their costs (including mitigation), and general environmental implications.

A. Existing Guidance

Army Corps of Engineers. General Regulatory Policies. 33 CFR Part 320 through 330.

Environmental Protection Agency. Guidelines for Specification of Disposal Sites for Dredged or Fill Material. 40 CFR Part 230.

Federal Highway Administration. Timing of Administrative Actions. 23 CFR § 771.113.

Memorandum of Agreement between the Environmental Protection Agency and the Department of the Army Concerning the Determination of Mitigation under the Clean Water Act Section 404(b)(1) Guidelines.

B. Early Coordination

The transportation agencies should consult with appropriate resource and regulatory agencies (i.e., the COE, EPA, USFWS, NMFS, Ecology, WDFW, Indian Tribes, federal land management agencies such as the Forest Service or Bureau of Land Management, and local government planning staff) early in the programming stage. This may include inviting the agency representatives to participate on the Technical Advisory Team. Field visits to the project area by project sponsor staff and resource agency personnel are invaluable for identifying resources of particular importance and potential project alternatives. Resource agencies should become involved in refining project-level alternatives and the selection criteria at this stage.

C. Resource Identification

The WSDOT Environmental Review Summary will address the potential impacts to these resources (see Appendix G, Level of Data Needs/Threshold for Involvement).

D. Initial Selection of Project-Level Alternatives

1. Development of Alternatives: Once the basic project purpose has been agreed upon according to the Purpose and Need Guidance, all reasonable alternatives that meet the basic purpose should be identified, and objectively compared. Any reasonable actions or alignments that avoid adverse impacts to Waters of the U. S./Waters of the State and associated sensitive species (see definitions) should be rigorously examined. If it is not possible to entirely avoid rivers, streams, and other Waters of the U. S./Waters of the State, crossings should be located to minimize impacts to aquatic resources. This could

include actions such as shifting the alignment to reduce the footprint of the transportation facility on the aquatic resource.

2. Criteria for Identifying Practicable Alternatives: Project alternatives that are not practicable can be eliminated if the reasons are carefully documented. The following practicability constraints may be used to carry out initial selection of alternatives:
 - a. Not meeting the project purpose and need (formulated according to Purpose and Need Guidance).
 - b. Excessive cost of construction (including all mitigation).
 - c. Severe operational or safety problems.
 - d. Unacceptable adverse social, economic, or environmental impacts.
 - e. Serious community disruption.
 - f. Unsuitable demographics (for mass transportation modes).
 - g. Logistical and technical constraints.
4. WSDOT should provide detailed documentation to demonstrate that rejected less-damaging alternatives considered are not practicable.

This step should be carried out using the selection criteria and process outlined above. Resource and regulatory agencies may disagree with the transportation agencies on what constitutes “excessive,” “severe,” “unacceptable,” or “serious” in determining practicability (see above list of selection criteria). Thus, for projects that will have a major adverse effect on aquatic resources, WSDOT must work closely with the resource and regulatory agencies to get agreement on the magnitude of constraints needed to render alternatives impracticable.

E. Example

WSDOT is proposing to program a project described by the local MPOs long-range plan. The plan identified the project’s purpose as reducing future congestion to at least “satisfactory” (level of service “D”) operating conditions. The transportation and programming agencies are able to reasonably identify only approximately \$90 million to use for this purpose.

Three project alternatives have been identified by the transportation agency, and are described in the following chart.

HYPOTHETICAL ALTERNATIVES
PROJECT SCOPING AND BUDGETING STAGE

| Alternative | C1 | C2 | C3 |
|--|--------------------------|---------------------------|-------------------------|
| Congestion (Level of Service) | fair ("C") | fair-good ("C"–"B") | good ("B") |
| Cost | \$82 million | \$87 million | \$90 million |
| Home/Business Displacements | 19 | 10 | 10 |
| Wetlands (Special Aquatic Site) Impacts | 4 hectares (10 acres) | 10 hectares (25 acres) | 2 hectares (5 acres) |
| Endangered Species Impacted | none | one | none |

At the scoping and budgeting stage, the intent of the project sponsor should be to identify the full range of practicable avoidance or minimization alternatives, all of which should be formally considered at the project development stage.

In this example, all the alternatives are within the range of expected funds and meet the project purpose. However, Alternative C2 would impact the greatest amount of wetlands and adversely affect an endangered species. Other practicable alternatives (C1 and C3) exist that avoid impacts to these resources to a greater extent. Therefore, Alternative C2 is rejected.

F. Documentation of Earlier Analyses

For most mode and location (alignment) alternatives, the initial selection alternatives analysis probably occurred at the transportation planning stage. If so, the transportation agency must either:

1. Document these earlier decisions as described above under III.D., and discuss how they meet the selection criteria listed at III.D.2.
- or
2. Provide evidence that the regulatory and resource agencies already concurred at the planning stage. For example, if one mode would be least damaging to aquatic resources but another mode was chosen during planning, the project sponsor should discuss in detail why the first mode is not practicable.

IV. ALTERNATIVES ANALYSIS FOR PROJECT DEVELOPMENT STAGE

The discussion below addresses how to satisfy the requirements of the Section 404 alternatives analysis in the context of a joint NEPA/SEPA or SEPA document.

A. Existing Guidance

The following list includes guidance on Section 404, NEPA, SEPA, and Section 4(f) of the Department of Transportation Act. A few of the entries are annotated to clarify how they pertain to Section 404 analyses for transportation projects.

Council on Environmental Quality. November 29, 1978. Regulations For Implementing the Procedural Provisions of the National Environmental Policy Act. 40 CFR Parts 1500–1508.

Council on Environmental Quality. March 23, 1981. “Forty Most Asked Questions Concerning CEQs NEPA Regulations.”

Environmental Protection Agency. December 24, 1980. Guidelines for Specification of Disposal Sites for Dredged or Fill Material. 40 CFR Part 230.

Environmental Protection Agency and U. S. Army Corps of Engineers. February 6, 1990. “Memorandum of Agreement Between the Environmental Protection Agency and the Department of the Army Concerning the Determination of Mitigation Under the Clean Water Act Section 404(b)(1) Guidelines.”

Federal Highway Administration. October 5, 1987. “Section 4(f) Policy Paper.” Director, Office of Environmental Policy, Washington D. C.

Federal Highway Administration. October 30, 1987. “Guidance for Preparing and Processing Environmental and Section 4(f) Documents.” Director, Office of Environmental Policy, Washington D.C. (Guidance to FHWA field offices and project applicants on preparing and processing environmental and Section 4(f) documents. Good discussion of how alternatives should generally be developed for NEPA [EIS] purposes [Attachment pages 14–17]. Describes procedures to be followed when wetland impacts will occur, and briefly states that the draft EIS should “evaluate alternatives that would avoid these wetlands” [Attachment page 27]. However, it focuses on determining the impact to wetlands and demonstrating compliance with Executive Order 11990, not Section 404; e.g., it lays out a procedure for a “Wetland Only Practicable Alternative Finding” to satisfy the Executive Order.)

Federal Highway Administration. November 15, 1989. "Alternatives Selection Process for Projects Involving Section 4(f) of the DOT Act." Director, Office of Environmental Policy, Washington D. C.

Washington State Department of Ecology. Regulations For Implementing the State Environmental Policy Act Rules WAC 197-11.

Washington State Department of Ecology. Revised 1993. "Ecology's SEPA Handbook."

Washington State Department of Transportation. Regulations for integration of the policies and procedures of SEPA WAC 468-12.

B. Continued Interagency Coordination

It is critical for transportation agencies to coordinate with the resource and regulatory agencies throughout all of the transportation stages. If agencies have not been approached at earlier stages, contact with the resource and regulatory agencies (see list under III.B.) at the project development stage will help determine the depth of the alternatives studies needed based on project scale and impact.

As joint NEPA/SEPA or SEPA documentation is developed, the transportation agency sponsor (or nominal SEPA lead agency), should obtain interagency concurrence on the direction of the alternatives analysis. During the NEPA/SEPA stage, the project sponsor (or nominal SEPA lead agency) should:

1. Follow the steps outlined in the NEPA/SEPA/404 Permit Concurrent Process for EISs in Appendix B and for EAs/CEs in Appendix C of the Agreement. These processes require interagency concurrence on purpose and need, and alternative selection criteria and process at various milestones.
2. Describe the results of this and any other coordination with the agencies in the Alternatives Analysis Report (see below).

C. Preparing the Alternatives Analysis

For projects requiring alternatives analyses, both draft and final versions of the EIS should be prepared in order to facilitate interagency input and concurrence. If a formal report is deemed unnecessary based on agency input, the project sponsor should determine from the agencies which elements of the procedure below need to be informally transmitted. The components of each report are described below.

The 404 Alternatives Analysis should be presented in a separate section of the EA/FONSI or EIS. However, if the outlined information is adequately discussed elsewhere in the document, these discussions can be referenced and summarized in the 404 alternatives analysis.

1. Draft Alternatives Analysis (to be included in the Draft joint NEPA/SEPA or SEPA document: see the NEPA/SEPA-404 Permit Concurrent Process in Appendix B and C of the Agreement).
 - a. Proposed Action - Describe the proposed action and explain the project purpose and need (see Purpose and Need in Appendix D of the Agreement).
 - b. Resource Identification - Follow the Level of Data Needs / Threshold for Involvement in Appendix G of the Agreement.
 - c. Documentation of Alternatives Considered But Rejected During the Initial Analysis

For most mode and location (alignment) alternatives, the initial selection of alternatives probably occurred at the transportation planning stage. If so, the transportation agency must either:

- (1) Document these earlier decisions as described above at III.D. and discuss how they meet the selection criteria listed at III.D.2.

or
 - (2) Provide evidence that the regulatory and resource agencies already concurred at the scoping and budgeting stage.
- d. Impacts of Each Alternative - The full range and scope of alternatives need to be presented in comparative form, thus sharply defining the issues and providing a clear basis of choice among options. The impacts on the aquatic resources and associated sensitive species should be discussed for each alternative, such as the amount to be lost, functions and values affected, and indirect impacts (e.g., growth inducement) and cumulative impacts to aquatic resources. Where several alternatives would affect aquatic resources, a summary table comparing the various impacts of each alternative should be prepared.

For projects that would result in a significant impact to wetlands or sensitive species, the project sponsor will provide more documentation on the impracticability of wetlands minimization or avoidance alternatives than would normally be needed for the purposes of NEPA or SEPA. Project sponsors will justify in detail

how the cost, performance, socioeconomic impacts, or other factors make the minimization or avoidance alternative impracticable.

Project sponsors should also avoid using ambiguous terms such as “slight,” “insignificant,” “adverse,” or “substantial” in the joint NEPA/SEPA or SEPA document when discussing environmental impacts, or project cost or performance. For example, in a draft EIS for a route extension, a less environmentally damaging alternative was eliminated partly because traffic impacts were “unacceptable” to a local city with no further discussion of what this term meant. Existing levels of service in another draft EIS were described simply as “unacceptable” or “adverse” to justify the construction of a new roadway. If such terms are used, they must be quantified with traffic data and modeling assumptions.

- e. Example - The project sponsor has identified two practicable alternatives (see table below) for analysis in the draft EIS.

HYPOTHETICAL ALTERNATIVES
PROJECT DEVELOPMENT STAGE

| Alternative | C1 | C3 |
|--|--------------------------|---------------------------------------|
| Congestion (Level of Service) | fair ("C") | good ("B") |
| Cost w/o mitigation | \$75 million | \$87 million |
| Cost w/est. mitigation | \$82 million | \$90 million |
| Home/Business Displacements | 19 | 10 |
| Wetlands (Special Aquatic Site) Impacts | 4 hectares (10 acres) | 2 hectares (5 acres) |
| Hazardous Waste Dump Disturbance | none | 600 meters (1970 feet) of frontage |

It has been discovered that the construction of Alternative C3 would extensively disturb a hazardous waste dump, and seriously harm the underlying aquifer. Thus, even though it would fill less wetlands, Alternative C3 is the more environmentally damaging of the two alternatives. Alternative C1 is therefore the least environmentally damaging practicable alternative, and is designated as the preferred alternative in the final EIS.

- f. Minimization of Impacts - Later analyses may consider location alternatives in more detail than the initial analysis and should also consider design variations. At this stage, enough detail on the project is known to make adjustments to avoid wetlands and

associated sensitive species. In some cases, temporal measures (e.g., no construction during the breeding season) may avoid or minimize impacts to associated sensitive species.

Transportation agencies should consider, individually or in combination, design variations such as:

- (1) Minor alignment shifts.
 - (2) Retaining structures.
 - (3) Bridging.
 - (4) Reduced cut and fill activity.
 - (5) Changes in profile.
 - (6) Changes in lane or median width.¹
 - (7) Variable slopes (to bring the toe of slope out of sensitive areas).
 - (8) Specific construction methods.
2. Final Alternatives Analysis - (To be included in the final joint NEPA/SEPA or SEPA document; see the NEPA/SEPA –404 Permit Concurrent Process in the Agreement Appendices B and C)

The final 404 Alternatives Analysis should:

- a. Summarize the information from the draft Alternatives Analysis.

and
 - b. Clearly demonstrate that alternatives that would avoid aquatic resources to a greater extent than the preferred alternative are not practicable.
 - (1) If a practicable alternative that completely avoids aquatic resources exists, it must be selected, unless that alternative has other significant adverse environmental consequences.
 - (2) If all the alternatives would result in some aquatic resource loss, the practicable alternative with least damage to aquatic resources must be selected, unless that alternative has other significant adverse environmental consequences. The impacts to aquatic resources for each alternative must be evaluated before compensatory mitigation for this comparison (refer to section II.C. above).
3. Record of Decision (for NEPA EISs only) - A record of decision must identify all alternatives considered and specify the alternative or alternatives that were considered to be environmentally preferable.

¹ Exceptions to mandatory design standards should be identified prior to the completion of the programming document if possible.

The record of decision must state whether all practicable means to avoid or minimize environmental harm from the alternative have been adopted, and, if not, why they were not.

4. COE Approval of Alternatives Analysis - The COE, through its permit process, will determine compliance of the alternatives analysis with the Section 404(b)(1) Guidelines and the public interest.